

Outline

- Moths vs. butterflies
- Quick review of the major families of (macro) moths

Moths vs. Butterflies

- In US, 800 species of butterflies, 10,000+ species of moths
- In SE Arizona, 250 species of butterflies, 2500+ species of moths
- Moths
 - Antenna not clubbed (One exception in AZ),
 - mostly night fliers.
 - some colorful day fliers
- Butterflies
 - Clubbed antenna
 - all day fliers, usually colorful

Major families of butterflies

- Hesperidae (skippers)
- Papilionidae (Swallowtails)
- Pieridae (whites & sulphurs)
- Lycaenidae (blues and hairstreaks)
- Riodinidae (metalmarks)
- Nymphalidae (brush-footed butterflies)

Hesperiidae

- 111 species in SE Arizona



"hooked" club on antenna



Papilionidae

- Swallowtails, 11 SE AZ species
- Big, with tails!



Pieridae

- Whites & Sulphurs, 30 AZ species



Lycaenidae

- Blues, coppers, hairstreaks
- 32 SE AZ species
- Small (less than 2 cm)
 - Usually contain some blue (blues)
 - Or tails/tail projection on hindwing (hairstreaks)





Riodinidae

- Metalmarks, 10 SE AZ species



Nymphalidae

- Brush-footed butterflies
- 73 SE AZ species
- Forelegs are very small (often appearing four-legged)
- Many common species



Major families of moths

- General distinction between
 - Macrolepidoptera
 - Microlepidoptera
- Focus here will be on macroleps, however, some families of "microleps" have very large species (2-3 inches)

Sphingidae (Hawkmoths)

- 145 species in US, 45 species from SE Arizona
- Fairly distinctive, "fighter-airplane" shaped
- A few day fliers
- Larvae are hornworms.



Rustic sphinx (*Manduca rustica*). Larva common on Desert Willow
In the fall



Snowberry clearwing (*Hemaris diffinis*)

Day-flying bumble mimic



Most colorful - Typhon sphinx (*Eumorpha typhon*). Larvae grape-feeder

Saturniidae (Silkmoths)

- 68 Species in US
- 27 Species in SE Arizona
- Some of our largest, and most colorful, moths
- Species in the genus *Hemileuca* are day-fliers



Western Imperial silkmoth, *Eacles oslari*



Splendid royal moth (*Citheronia splendens sinaloensis*)



Hubbard's small silkmoth. Common



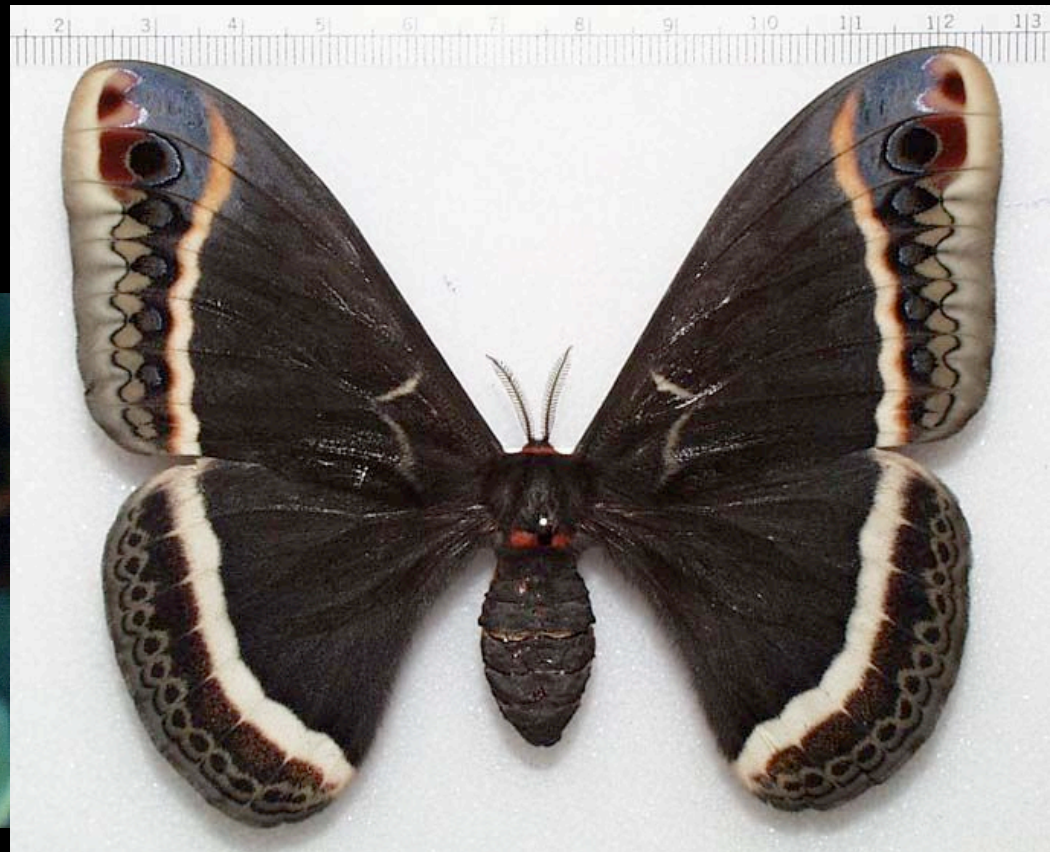
A. oculea (5th instar)
Photo by C. Conlan



Oculea silkmoth (*Antheraea oculea*)



E. calleta (5th instar)
Photo by C. Conlan



Calleta Silkmoth, *Eupackardia calleta*

Lasiocampidae (Tent Caterpillars)

- 35 Species in North America
- 16 species in SE Arizona
- Larvae are often gregarious, some making tents
- Includes several very large moths, including *Dicogaster coronada*
- Close relatives to silkmoths
- A few species have day flying males that do not come to light



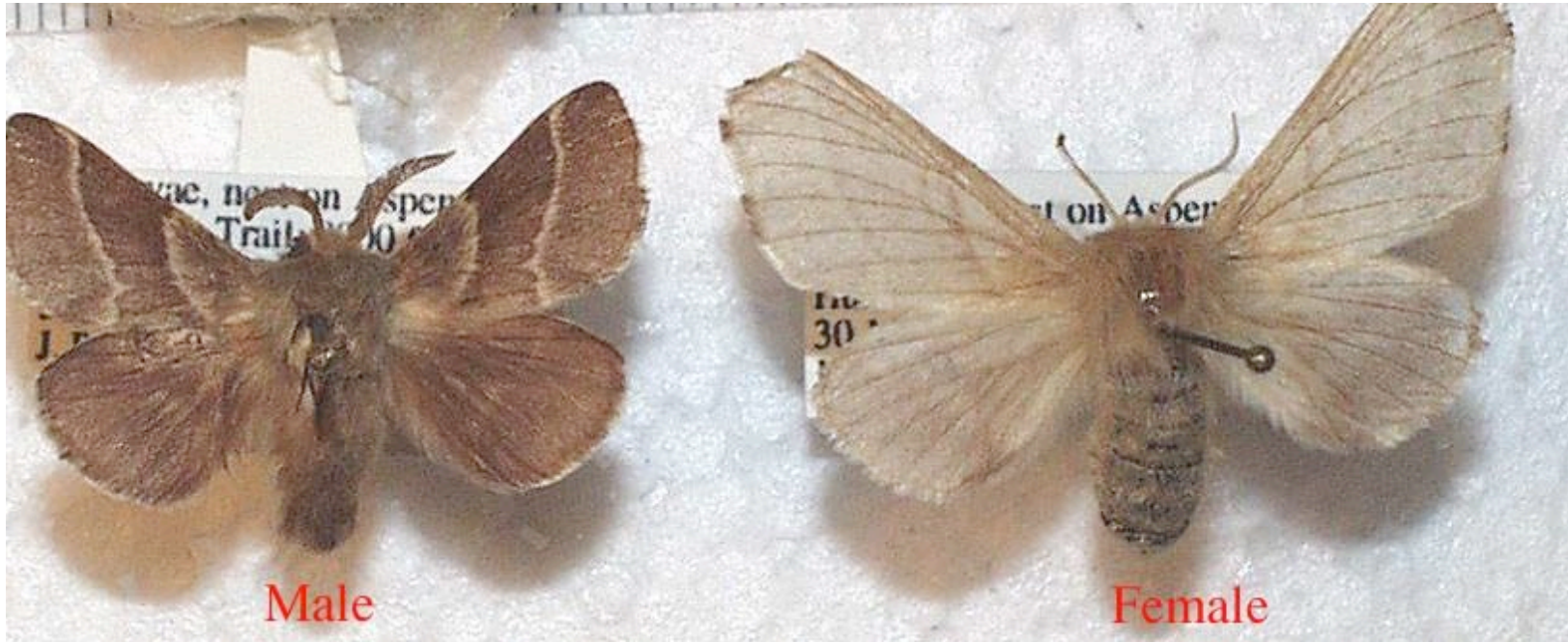
Dicogaster coronada



Gloveria gargamelle

Gloveria gargamelle





Male

Female

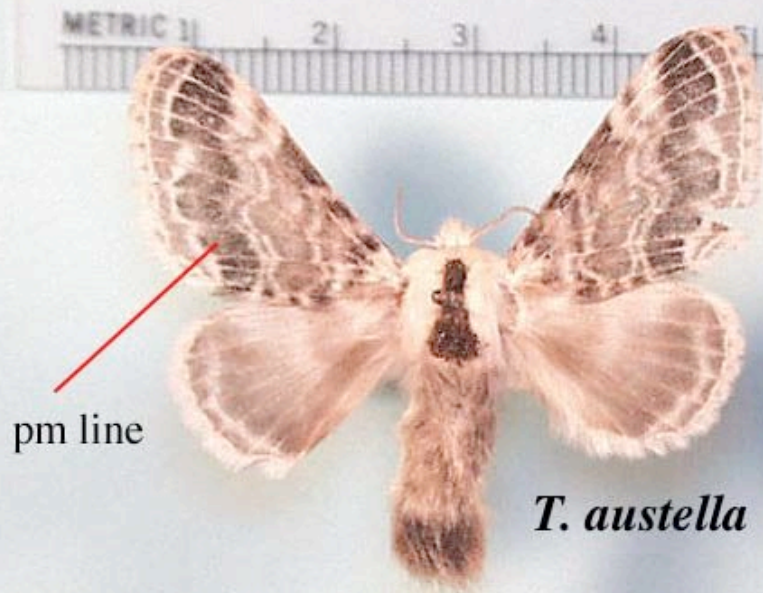
On Aspen, Carr Peak Trial, 8500 feet
Huachuca Mts, Cochise Co, AZ
30 May 1999 J. B. Walsh



On Aspen, Carr Peak Trial, 8500 feet
Huachuca Mts, Cochise Co, AZ
May 1999 J. B. Walsh



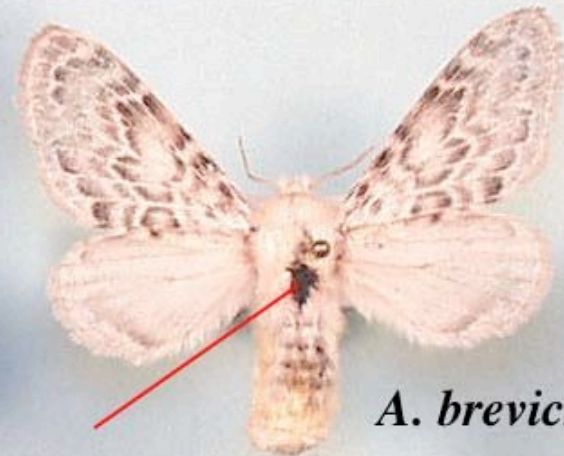




pm line

T. austella

postmedial line thick, jagged



A. brevicrista

fewer black scales on thorax



notch

T. nigricaria

distinct notch in postmedial line



T. glenwoodii

Postmedial line relatively smooth

Apatelodidae

- Close relatives of the tent caterpillars (*Lasiocampidae*)
- 5 Species in NA, 2 in Arizona, including one that is rather common, *Apatelodes pudefacta*
- Also a close relative of Silkmoths



Apatelodes pudefacta [MONA 7664]

AZ Santa Cruz Co, 4000 ft Pena Blanca Canyon,
MV/UV lights, 18 July 2001. B. Walsh leg.

AZ Santa Cruz Co, 4000 ft Pena Blanca Canyon,
MV/UV lights, 8 July 1999. B. Walsh leg.



Mimallonidae

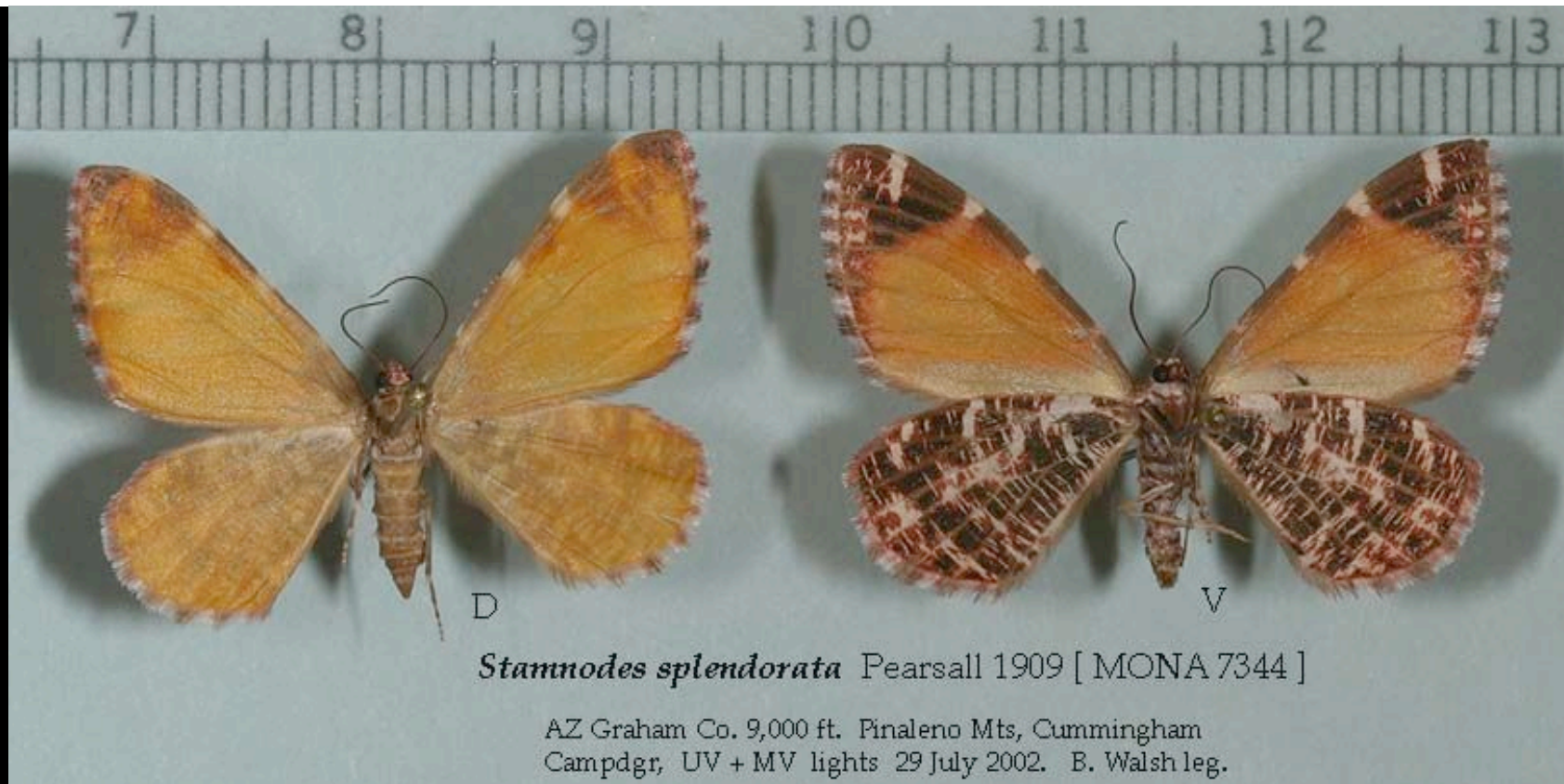
- One AZ species, *Lacosoma arizonicum*



Geometridae (Inchworms)

- 1400 NA species
- 400 +species in SE Arizona
- Usually with fairly distinct angular wings
- Larvae are inchworms







AZ Cochise Co, 7700' Onion Saddle, Chirichahua Mts,
30 Sept. 2000. J. B. Walsh leg. [MONA 6984]

Notodontidae (Prominents)

- 136 Species in NA, 50+ known species from SE Arizona
- Strong sexual dimorphism
- Notodontids vs. Noctuids --
 - Notodontids more narrowly-winged
 - Notodontids often with feathery antenna
- Larvae very distinctive



AZ Chocise Co., 4000 ft Babocomari River, 6 NNE
Huachuca City. MV + UV lights. 19 May 2001. J. B. Walsh leg



ex larvae, on Populus, Tolland Co, CT
20 Aug 1998 Copyright D. L. Wagner





Lirimiris truncata





Astylis biedermani

ex female, Ash Canyon, Huachuca Mts
Cochise Co, AZ. viii-17-99, photo ix-19-99
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Dalceridae

- One AZ, NA species



Thrididae

- 2 AZ species



Drepanidae

- 3 SE AZ species



Megalopygidae (Flannel moths)

- 11 species in NA
- 6 in SE Arizona
- The larvae are covered with stinging hairs.





Limacodidae
(Slug-caterpillar Moths)

- 52 species in NA
- 9 in Arizona
- The larvae are amazing



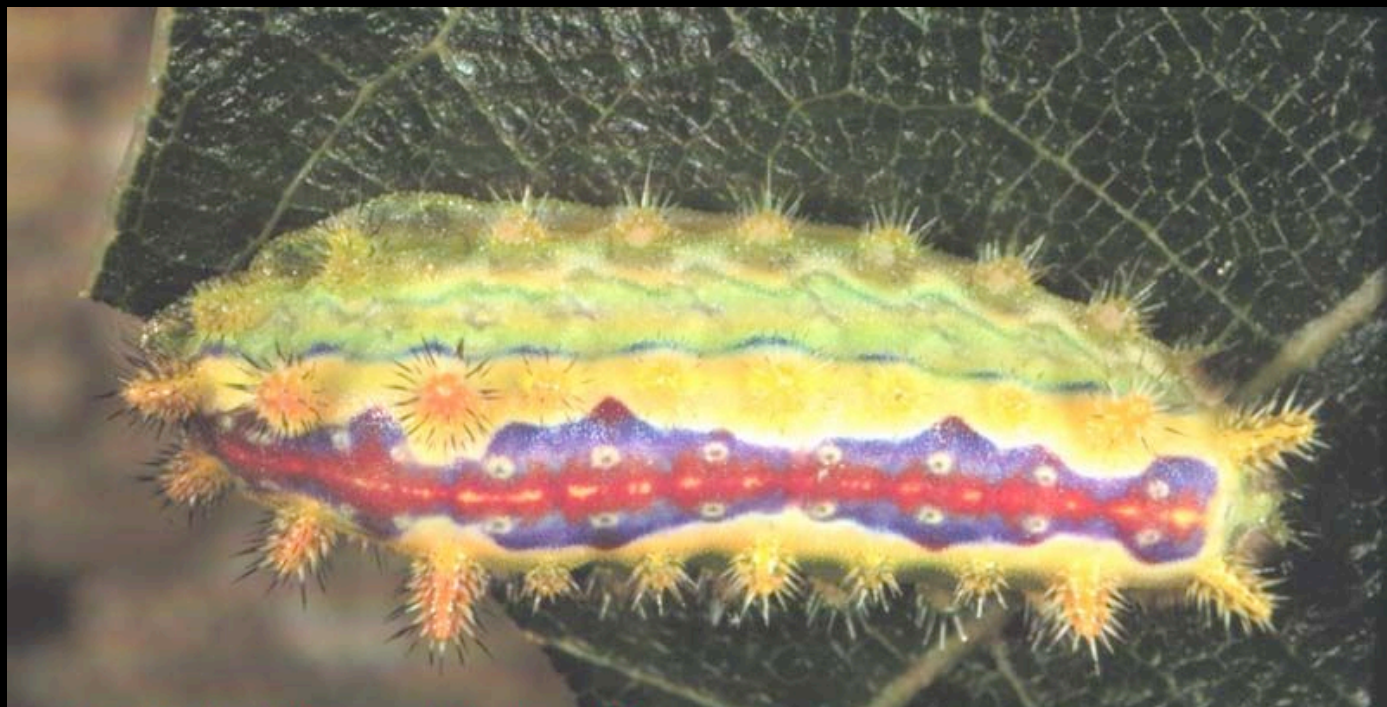
on Manzanita, Pena Blanca Cyn
Santa Cruz Co, AZ 26 Sept 1998
Copyright M. Singer



on Manzanita, Pena Blanca Cyn





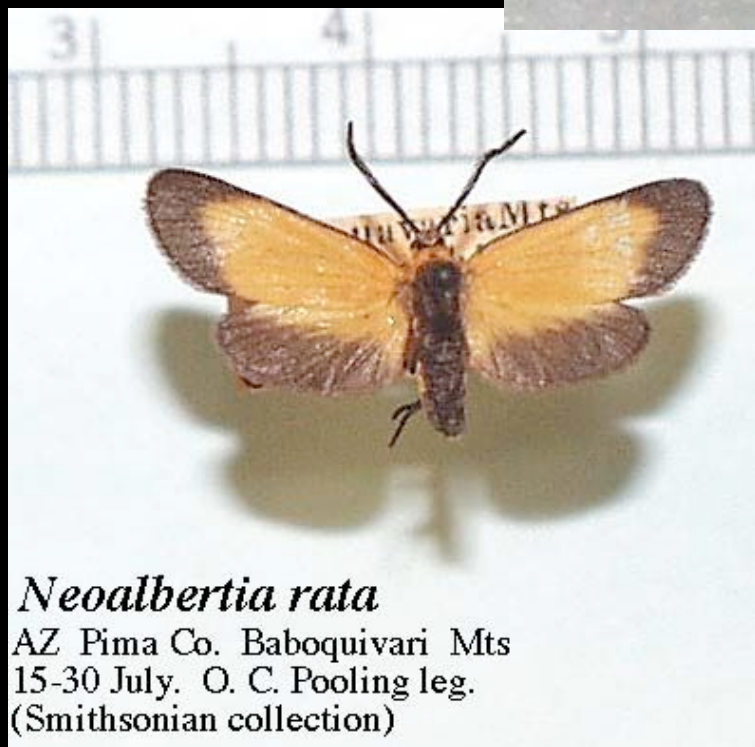


ex female, Ash Canyon, Huachuca Mts
Cochise Co, AZ fem. viii-7-99, lar ix. -15-99
Copyright D. L. Wagner



Zygaenidae (Burrants)

- 22 species in NA
- 12 in SE Arizona
- Small, often colorful, day fliers. Usually hard to see



Neolbertia rata

AZ Pima Co. Baboquivari Mts
15-30 July. O. C. Pooling leg.
(Smithsonian collection)

Sesiidae (Clear-wing moths)

- 115 NA species
- 46+ SE Arizona species
- ALL day fliers
- Common, but usually entirely overlooked
- Collected using pheromone traps



Cossidae (Carpenter-moths)

- 45 NA species
- 20 SE Arizona species
- Larvae bore into wood



Prionoxystus robiniae

Major changes in higher-order classification

- Old:
 - Noctuids (Noctuidae),
 - tiger moths (Arctiidae),
 - tussock moths (Lymantriidae) all separate families
- New:
 - tiger moths, tussock moths, and some Noctuids are members of Erebidae
 - Also have three new families
 - Eutelidae
 - Nolidae
 - Noctuidae

Arctiinae (Tigermoths)

- Now regarded as a subfamily of the Erebidae
264 *Arctiinae* in NA, 104 species in SE Arizona
- Adults are mostly quite colorful
- Several are day-fliers
- Larvae are "woolly-bear" caterpillars



Dysschema howardi -- largest tiger moths in North American



Cistene species (6 in SE Arizona)
often found at flowers during the day



Hemihyalea edwardsii



Aemila ambigua



Apocrisias thaumasta



Lymantriinae

- Tussock moths, 4 SE AZ species



Old: *Noctuidae* (Cutworms)

- 3000 species in US
- 900+ in SE Arizona
- Contains our largest moth, the Black Witch
- 19 subfamilies in Arizona
- Species are usually dull (black/brown/grey), although some rather colorful
- Larvae are cutworms

New: The breakup of Noctuids

- Erebidae
 - Lymantriinae (tussock moths)
 - Arctiinae (tiger moths)
 - Erebidae (a chunk of the old nocutids)
- Eutelidae
- Nolidae
- Noctuidae
 - The bulk of the rest of the nocutids

Erebidae

- The old noctuids in the Erebidae now in 17 subfamilies
- Essentially, all of the early subfamilies of noctuids on the Hodges checklist up through the Catocalinae

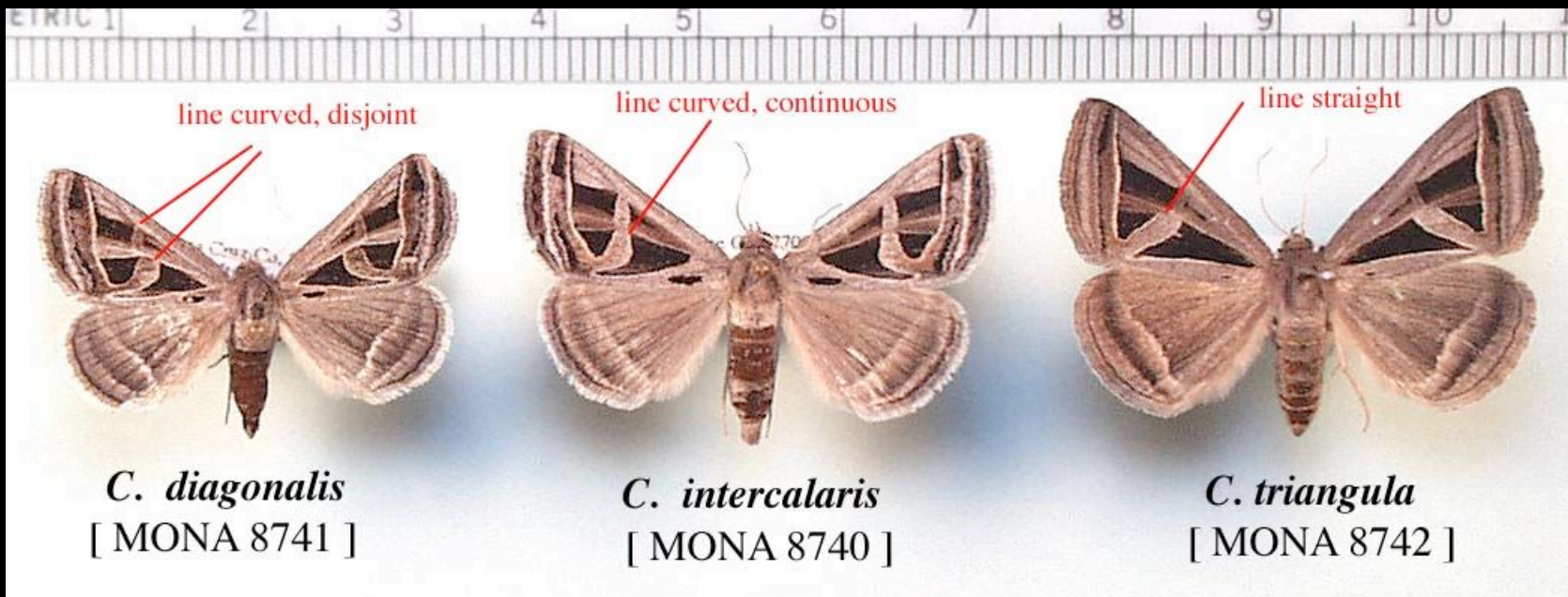


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Melipotis fasciolaris [MONA 8599]

AZ Santa Cruz Co, 5000 ft Patagona Mts, Harshaw Crk
MV lights, 21 Sept. 2000. J. B. Walsh leg.



line curved, disjoint

C. diagonalis
[MONA 8741]

line curved, continuous

C. intercalaris
[MONA 8740]

line straight

C. triangula
[MONA 8742]

Eutelidae

- Five SE Arizona species



Eutelia pulcherrimus [MONA 8968]

AZ Cochise Co. Huachuca Mts

Ash Cyn, 5100 ft, 10 Aug 1991

D. C. Ferguson leg (Smithsonian collection)

Nolidae

- 7 SE AZ species

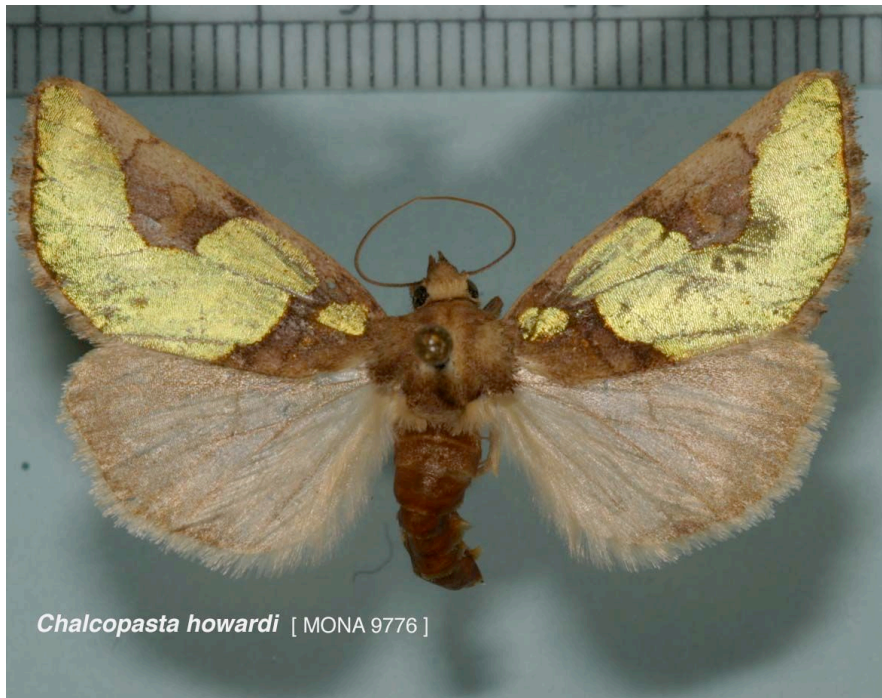


Meganola conspicua [MONA 8988]

AZ Pima Co. 8000 ft Santa Catalina Mts,
Summerhaven, MV/UV lights.
15 Sept. 2001. B. Walsh leg

Nocutidae

- The family contain the rest (majority) of the old Nocutidae
- 20 subfamilies. Includes the old subfamilies (some renamed and many split further)
 - Plusiinae
 - Acontiinae
 - Amphipyrrinae
 - Stiriinae
 - Cuculliinae
 - Hadeninae
 - Nocuinae
 - Heliothinae





on Talimum, nr. Pearce,
Cochise Co, AZ 11 Sep 1996
Copyright M. Singer





Schinia arcigera ferricasta [MONA 11128a]
 AZ Cochise Co., 6000 ft Huachuca Mts,
 CopperCanyon MV/UV lights. 30 July
 2000. B. Walsh leg



Schinia siren
 [MONA 11115]
 AZ Yavapai Co, July 16-23 Barnes collection (Smithsonian)



Schinia florida
 [MONA 11164]
 AZ Cochise Co., Huachuca Mts,
 Palmerlee. No date. (Smithsonian)